

**IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE**

BEST MEDICAL INTERNATIONAL, INC.,	)	
	)	
<i>Plaintiff,</i>	)	
	)	
v.	)	Civil Action No.: 18-cv-01599-MN
	)	
VARIAN MEDICAL SYSTEMS, INC., AND	)	
VARIAN MEDICAL SYSTEMS	)	
INTERNATIONAL AG,	)	
	)	
<i>Defendants.</i>	)	
	)	

**JOINT CLAIM CONSTRUCTION CHART**

Plaintiff Best Medical International, Inc. (“Best”) and Defendants Varian Medical Systems, Inc. and Varian Medical Systems International, AG (collectively “Varian”) submit the following Joint Claim Construction Chart according to the Court’s Scheduling Order. *See* D.I. 29, ¶ 11.

Best submits that no terms/phrases require formal construction and the plain and ordinary meanings of the terms/phrases should apply as they would have been understood by one of ordinary skill in the art. Varian submits that the terms/phrases listed below require construction by the Court. Varian’s proposed constructions are set forth below, as are Best’s constructions (which are offered only in the alternative).

Each party reserves the right to rely on portions of the intrinsic record cited by the other party in the Joint Claim Construction Chart. Each party further reserves the right to rely on additional intrinsic evidence in the event necessary to rebut evidence and arguments made by the other party.

<b>Civil Action No.: 1:18-cv-01599 MN – Joint Claim Construction Chart</b>					
<b>#</b>	<b>Claim Term/Phrase</b>	<b>Varian’s Proposed Construction</b>	<b>Varian’s Intrinsic Evidence</b>	<b>Best’s Proposed Construction</b>	<b>Best’s Intrinsic Evidence</b>
<b>1</b>	<p>“computer ... to computationally”:</p> <p>(A) “obtain a proposed radiation beam arrangement” (’283 patent claims 6-7, 12, 24-25, 27-28; ’096 patent claims 18, 31, 33)</p>	<p>The term “computer” should be construed under 35 USC § 112 ¶ 6 and <i>Williamson v. Citrix</i>, 792 F.3d 1339 (Fed. Cir. 2015), with the following recited function and corresponding structure:</p> <p><b>Function (A):</b> computationally obtain a proposed radiation beam arrangement</p> <p><b>Structure (A):</b> a computer programmed with a simulated annealing radiotherapy planning (SARP) optimization algorithm that generates a radiation beam arrangement used as input for the next iteration of optimization.</p>	<p>For corresponding structures (A) and (B), <i>see</i> ’283 at 5:1-3, 5:43-45, 6:20-22, 12:27-47; ’096 at 8:34-59. For corresponding structures (C) and (D), <i>see</i> ’283 at 12:27-47; ’096 at 8:34-59. For corresponding structure (E), <i>see</i> ’283 at 5:1-3, 5:43-45, 6:20-22, 12:27-47; ’096 at 8:34-59. <i>See also</i> ’283 at Abstract, 1:10-12, 2:59-4:10, 4:13-8:28, 8:61-67, 9:13-64, 10:31-14:10, 14:59-15:45, Figs. 2-6B and corresponding descriptions at 8:36-50; ’283 claims 1-2, 6-7, 12, 14, 18, 22, 24-25, 27-29, 36, 40, 44, 46; ’283 Prosecution History at 2/9/1999</p>	<p>Plain and ordinary meaning.</p> <p>Not a 35 U.S.C. § 112, ¶ 6 issue, thus no surplus construction for alleged functions and structures (A) to (E) is provided.</p> <p>If a construction is required, in the alternative: a computer is “a programmable electronic device that can store, retrieve, and process data.”</p>	<p><b><u>Intrinsic Support</u></b></p> <p><b>’283 Pat. Specification</b></p> <p>“The optimization method may be carried out using conventional equipment, including a conventional linear accelerator (“LINAC”) 300, as shown in FIG. 1, having a rotatable gantry, a conventional computer or set of computers, and plan optimization software, which utilizes the optimization method of the present invention” ’283 Pat., at col. 9, lns. 59-64. (See BEST00000014). “[A] method of determining an optimized radiation beam arrangement... entering the desired partial volume data into a</p>

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	<p><b>(B)</b> “obtain a set of proposed beam weights” (’283 patent claim 46)</p>	<p><b>Function (B):</b> computationally obtain a set of proposed beam weights</p> <p><b>Structure (B):</b> a computer programmed with a SARP optimization algorithm that generates a set of beam weights used as input for the next iteration of optimization.</p>	<p>Office Action at 2-3, 5/17/1999 Response at 5-6, Notice of Allowability at 1; ’096 at Abstract, 1:10-12, 2:59-4:9, 4:13-29, 5:3-6:2, 6:35-15:29, Figs. 2-8F and corresponding descriptions at 4:36-60; ’096 claims 1, 18, 21, 25, 31, 33, 37, 37-38, 44, 46; ’096 Prosecution History at Notice of Allowability at 2-3; “Optimization of Conformal Radiotherapy Dose Distributions by Simulated Annealing”, S. Webb, <i>Physics and Medical Biology</i>, Vol. 34, pp. 1349-1370 (1989); “Optimization of Conformal Radiotherapy Dose Distributions by Simulated Annealing:</p>		<p>computer... using the computer to computationally approximate... using the computer to computationally calculate... using the computer to computationally obtain... using the computer to computationally change... computationally constructed by the computer based on numerical values representing the partial volume data entered into the computer.” ’283 Pat., at col. 7, lns. 32-65. (See BEST00000013).</p> <p><b>’283 Pat. File History</b> PTO cites US 5,513,238 and US 5,602,892 in Office Action dated 02-16-1999. (See</p>
	<p><b>(C)</b> “change the proposed radiation beam arrangement iteratively” (’283 patent claims 6-7, 12, 24-25, 27-28; ’096 patent claims 18, 31, 33)</p>	<p><b>Function (C):</b> computationally change the proposed radiation beam arrangement iteratively</p> <p><b>Structure (C):</b> a computer programmed with a SARP optimization algorithm that randomly changes the beam arrangement at each iteration.</p>	<p>of Conformal Radiotherapy Dose Distributions by Simulated Annealing”, S. Webb, <i>Physics and Medical Biology</i>, Vol. 34, pp. 1349-1370 (1989); “Optimization of Conformal Radiotherapy Dose Distributions by Simulated Annealing:</p>		

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	<p><b>(D)</b> “change the set of proposed beam weights iteratively” (‘283 patent claim 46)</p> <p><b>(E)</b> “calculate [an/the] optimized radiation beam arrangement” (‘283 patent claims 2, 46; ‘096 patent claims 44, 46)</p>	<p><b>Function (D):</b> computationally change the set of proposed beam weights iteratively</p> <p><b>Structure (D):</b> a computer programmed with a SARP optimization algorithm that randomly changes the beam weights at each iteration.</p> <p><b>Function (E):</b> computationally calculating [an/the] optimized radiation beam arrangement</p> <p><b>Structure (E):</b> a computer programmed with a SARP optimization algorithm.</p>	<p>2. Inclusion of Scatter in the 2d Technique”, S. Webb, <i>Physics and Medical Biology</i>, vol. 36, pp. 1227-1237, (1991).</p>		<p>BEST00000584-585). US 5,513,238, at col. 1, lns. 60-62 (BEST00000249-253). US 5,602,892, at col. 3, ln. 65 to col. 4, ln. 1.</p> <p><b>’096 Pat. Specification</b></p> <p>“The optimization method may be carried out using conventional equipment, including a conventional linear accelerator (“LINAC”) 300, as shown in FIG. 1, having a rotatable gantry, a conventional computer or set of computers, and plan optimization software, which utilizes the optimization method of the present invention.” ‘096 Pat., at col. 5, ln. 64 to col. 6, ln. 2. (See BEST00000676). “A suitable computer is utilized in performing the</p>

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					Plan Optimization step 802 (FIG. 2), as well as the other steps of the radiation planning system. For illustration purposes only, a programmable 150 Mhz pentium computer with four symmetric multiprocessors, running the Sun Solaris operating system, and having 256 megabytes RAM could be utilized in performing the Plan Optimization step 802 (FIG. 2).” ’096 Pat., at col. 8, lns. 52-59. (See BEST00000664, 677).

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<b>2</b>	“approach correspondence of” (’283 patent claims 6-7, 12; ’096 patent claim 18)	improve the degree of matching of	<i>See</i> ’283 at 3:17-4:10, 4:13-6:22, 7:31-65, 9:49-59, 10:35-12:20, 12:48-14:10; ’283 claims 1-2, 10-12, 14, 18, 24, 26, 28, 30, 32, 37, 39, 40-41, 44, 47, Figs. 3-4, 5B and corresponding description at 8:39-44; ’283 Prosecution History at 2/9/1999 Office Action at 2-3, 5/17/1999 Response at 5-6, Notice of Allowability at 1; ’096 at 3:17-4:9, 4:17-29, 5:54-64, 6:40-8:27, 8:60-15:29, Figs. 3-5, 7A-8F and corresponding descriptions at 4:39-4:46, 4:53-60; ’096 claims 1-2, 7-11, 16-18, 21, 29, 31, 37-38, 41-42; ’096 Prosecution History at Notice of Allowability at 2-3. <i>See</i>	Plain and ordinary meaning.  If a construction is required, in the alternative: obtain a closer agreement of	<b>’283 Pat. Specification</b> “[U]sing a computer to computationally change the proposed radiation beam arrangement iteratively, incorporating a cost function at each iteration to approach correspondence of a CDVH associated with the proposed radiation beam arrangement to a CDVH associated with a pre-determined desired dose prescription”. ’283 Pat., at col. 4, lns. 19-24. (See BEST00000011). “Modern LINACs radiate a tumor site by making multiple passes along varying arcs approaching the target volume along different entrance paths, each arc being directed toward a point central to a target volume, commonly referred to as an epicenter of the

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			<p><i>also</i> '283 at Abstract, 1:10-12, 2:59-4:10, 4:13-8:28, 8:61-67, 9:13-48, 10:31-15:45, Figs. 2-6B and corresponding descriptions at 8:36-50; '096 at Abstract, 1:10-12, 2:59-4:9, 4:13-29, 5:3-6:2, 6:35-15:29, Figs. 2-8F and corresponding descriptions at 4:36-60.</p>		<p>treatment volume." '283 Pat., at col. 8, ln. 67 to col. 9, ln. 5. (See BEST00000013-14).</p> <p><b>'096 Pat. Specification</b></p> <p>"[U]sing a computer to computationally obtain a proposed radiation beam arrangement; using the computer to computationally change the proposed radiation beam arrangement iteratively, incorporating a cost function at each iteration to approach correspondence of a CDVH associated with the proposed radiation beam arrangement to a CDVH associated with a pre-determined desired dose prescription." '096 Pat., at Abstract. (See BEST00000661).  "Modern LINACs radiate</p>

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					a tumor site by making multiple passes along varying arcs approaching the target volume along different entrance paths, each arc being directed toward a point central to a target volume, commonly referred to as an epicenter of the treatment volume.” ’096 Pat., at col. 5, lns. 9-14. (See BEST00000661).
<b>3</b>	“correspondence to” (’283 patent claim	the degree of matching with	See term [2].	Plain and ordinary meaning.	<b>’283 Pat. Specification</b> “At each iteration, the dose distribution



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	46)			If a construction is required, in the alternative: a closer agreement between	resulting from the proposed beam selection is compared to a prescribed dose for the tumor volume and surrounding tissue structures. If the increase or decrease in beam weights would lead to a greater correspondence to the desired prescription, the change is accepted.” ’283 Pat., at col. 4, lns. 40-45. (See BEST00000014). “In the Plan Optimization step 803, the radiation plan optimization is a specific case of an inverse problem, where the goal is to determine the best way to achieve the dose prescription.” ’283 Pat., at col. 12, lns. 27-30. (See BEST00000015).
<b>4</b>	“conform to” (’096 patent claims	improve the degree of matching with	See term [2].	Plain and ordinary meaning.	<b>’096 Pat. Specification</b> “Alternatively, a set of

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	31, 33)			If a construction is required, in the alternative: obtain a closer agreement with	values could be created that allows structure limits to be exceeded by a set amount if such excess allows better conformation to the desired target CDVH curve 100." '096 Pat., at col. 12, lns. 54-57. (See BEST00000679). "In order to be able to treat tumors having concave borders, it is necessary to vary the intensity of the radiation beam across the surface of the tumor, as well as vary the outer configuration of the beam to conform to the shape of the tumor presented to the radiation beam." '096 Pat., at col. 2, lns. 10-14.

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<b>5</b>	“cost zone” <sup>1</sup> (’096 patent claims 21, 23)	area above or below a CDVH curve or a segment of a CDVH curve	<i>See</i> ’283 at 4:33-66, 5:9-6:22, 12:46-15:45, Figs. 3-4, 5B and corresponding description at 8:39-44; ’283 claims 2, 14; ’283 Prosecution History at 2/9/1999 Office Action at 2-3, 5/17/1999 Response at 5-6, Notice of Allowability at 1; ’096 at 8:60-15:29, Figs. 3-4, 5B and corresponding description at 8:39-44; ’096 claims 2, 11, 21; ’096 Prosecution History at Notice of Allowability at 2-3. <i>See also</i> ’283 at Abstract, 1:10-12, 2:59-4:10, 4:13-8:28, 9:49-59, 10:35-12:20; ’096 at 3:17-4:9, 4:17-29, 5:54-	Plain and ordinary meaning.  If a construction is required, in the alternative: portion or region	<b>’283 Pat. Specification</b>  “Referring again to FIGS. 3 and 4, utilizing familiar target and volume CDVH curves such as target and volume CDVH curves 100, 200 (FIGS. 3 and 4), certain regions or zones of the CDVH curves may be identified as being more important for a particular type of target or structure.” ’283 Pat., at col. 12, lns. 48-52. (See BEST00000015). “In the cost function of the present invention, each region, or zone, of the CDVH is assigned a relative weight, according to the importance of that region, or zone, of the

<sup>1</sup> Varian submits that “cost zone” here and “zone” below should be treated as one and the same term.

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			64, 6:40-8:27.		<p>CDVH.” 283 Pat., at col. 13, lns. 4-7. (See BEST00000016).</p> <p><b>'096 Pat. Specification</b></p> <p>“Referring again to FIGS. 3 and 4, proposed CDVH curves 101, 201, which reflect the effect of a prescription proposed by the system during a given iteration of the Plan Optimization step 803 (FIG. 2), are shown... Certain control points or regions N, N', Q, Q', X, and X' of the composite CDVH curves 10, 20 may be identified as being more important for a particular type of target or structure.” '096 Pat., at col. 8, ln. 60 to col. 9, ln. 3. (See BEST00000677-678).</p>

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<b>6</b>	“zone” (’283 patent claims 7, 12; ’096 patent claims 21, 23)	area above or below a CDVH curve or length of a segment of a CDVH curve	<i>See</i> term [6].	Plain and ordinary meaning.  If a construction is required, in the alternative: portion or region	<b>’283 Pat. Specification</b>  “Referring again to FIGS. 3 and 4, utilizing familiar target and volume CDVH curves such as target and volume CDVH curves 100, 200 (FIGS. 3 and 4), certain regions or zones of the CDVH curves may be identified as being more important for a particular type of target or structure.” ’283 Pat., at col. 12, lns. 48-52. (See BEST00000006, 15). “In the cost function of the present invention, each region, or zone, of the CDVH is assigned a relative weight, according to the importance of that region, or zone, of the CDVH.” ’283 Pat., at col. 13, lns. 4-7. (See BEST000000016).

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					<p><b>'096 Pat. Specification</b></p> <p>“Referring again to FIGS. 3 and 4, proposed CDVH curves 101, 201, which reflect the effect of a prescription proposed by the system during a given iteration of the Plan Optimization step 803 (FIG. 2), are shown... Certain control points or regions N, N', Q, Q', X, and X' of the composite CDVH curves 10, 20 may be identified as being more important for a particular type of target or structure. '096 Pat., at col. 8, ln. 60 to col. 9, ln. 3.” (See BEST00000664, 677-678).</p>

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<b>7</b>	<p>“objective cost function”</p> <p>(’175 patent claims 13, 15, 19)</p>	<p>mathematical function that determines a numerical value based on factors used to iteratively optimize a beam arrangement</p>	<p>’175 at 2:40–45; 6:13–18; 6:44–48; 6:53–61.</p> <p><i>See also</i> ’175 at 2:18–21; 4:27–32 (incorp. the ’283 and ’096 patents by reference); 6:5–18; FIGS. 1, 3, 5, 6 and related descriptions thereof.</p> <p>August 7, 2006 Amendment and Response to Office Action Dated May 3, 2006, at 12</p> <p>January 30, 2007 Amendment and Response to Office Action Dated October 25, 2006, at 9</p> <p>January 30, 2007 Mark Carol Declaration under 37 CFR 1.132, at 4 ¶ 6a4 &amp; Ex. E</p> <p><i>See also</i> ’283 at Abstract; 3:17–21; 4:14–33; 5:9–47; 6:29–</p>	<p>Plain and ordinary meaning.</p> <p>If a construction is required, in the alternative: mathematical function that determines a value based upon factors</p>	<p><b>’175 Pat. Specification</b></p> <p>The ’175 Pat. incorporates the contents of the ’283 Pat. and the ’096 Pat. ’175 Pat., at col. 4, lns. 27-32. (See BEST00001840). “Existing methods and apparatus utilize a computational method of establishing optimized treatment plans based on an objective cost function that attributes costs of radiation of various portions of both the tumor and surrounding tissues, or structures.” ’096 Pat., at col. 3, lns. 17-21. (See BEST00000675).</p> <p><b>’175 Pat. File History</b></p> <p>“In optimization, an optimization algorithm such as, for example,</p>

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			35; 6:52–60; 7:11–18; 7:46–58; 9:29–48; 16:33–38; 19:43–50; 20:44–48; 22:35–39  <i>See also</i> ’096 at Abstract; 5:39–44; 16:46–49; 19:48–52; 20:15–19; 20:61–64  <i>See also</i> Intrinsic Evidence cited for “optimizer” term below.		simulated annealing or gradient descent, can be applied in order to locate, e.g., the minima of a cost function (also known as an objective function or objective cost function) in order to determine some desired result.” Response to Office Action dated 08-03-2006, at p. 12. (See BEST00002094).
<b>8</b>	“optimizer” (’175 patent claims 13, 15, 19)	iterative optimization algorithm	’175 at 1:41–42; 1:44–47; 3:5–11; 4:17–26; 5:27–30; 6:53–61.  <i>See also</i> ’175 at 4:27–32 (incorp. the ’283 and ’096 patents by reference).  August 7, 2006 Amendment and Response to Office Action dated May 3, 2006, at 12–16  January 30, 2007	Plain and ordinary meaning.  If a construction is required, in the alternative: program or device that attempts to find a preferred solution	<b>’175 Pat. Specification</b>  “This cost term drives the optimizer toward a simpler, more efficient solution.... The acceptable inflation, or increase, of total monitor units is limited as the optimizer progresses from simple, efficient treatment plans toward more complex treatment plans.” ’175 Pat., at col. 1, Ins. 41-47. (See



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			<p>Amendment and Response to Office Action Dated October 25, 2006, at 9, 11–12, 15, 18–19</p> <p>January 30, 2007 Mark Carol Declaration under 37 CFR 1.132, at 4 ¶ 6a5, 9 ¶ 6e2, 10 ¶ 6f3</p> <p><i>See also</i> ’283 at 9:29–48 and additional citations to ’283 and ’096 patents for “objective cost function” term above.</p>		<p>BEST00001839). The ’175 Pat. incorporates the contents of the ’283 Pat. and the ’096 Pat. ’175 Pat., at col. 4, lns. 27-32. (See BEST00001840). “The optimizer of the present invention computes an optimized treatment plan, or beam arrangement,...” ’283 Pat., at col. 9, lns. 29-20. (See BEST00000014). “The values assigned ... codify the system developer’s knowledge of each type of target and structure and will determine how the optimizer resolves conflicts between structures and targets.” ’096 Pat., at col. 12, lns. 27-32. (See BEST00000679).</p> <p><b>’175 Pat. File History</b></p>

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					<p>“These two patents ['283 Pat. and '096 Pat.] provide, for example, a description of the function of an optimizer and how a cost function is utilized by the optimizer along with background information providing an understanding of an implementation of an optimization process....[T]he delivery cost term is... used by the optimizer to evaluate each potential intensity pattern to thereby determine the optima (best value) of the objective function to... be presented to the clinician during the iterative optimization process... [I]n the conventional optimization process, the optimizer selects a beam</p>

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					arrangement which provides optimal dosimetric fitness... Applicant’s claimed invention are [] directed to...improvements within the optimization loop or optimization process performed by the optimizer.” Response to Office Action dated 08-03-2006, at pp. 11-16. (See BEST00002093-2098). “Regarding independent Claim 29, neither of the cited documents disclose, teach, or suggest applying prescription parameters to each of a plurality of optimization algorithms within an optimizer...” Response to Office Action dated 01-25-2007, at p. 21. (See BEST00002177).
<b>9</b>	“intensity map[s]”	representation[s] of	’175 at 1:13–16; 1:66–	Plain and ordinary	<b>’175 Pat. Specification</b>

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	('175 patent claims 13, 15, 19)	dose distribution	<p>67; 2:3–4; 2:10–11; 2:11–12; 3:31–37; 3:50–55; 4:39–40; FIGS. 2A, 2B, 2C, 4A, 4B, 4C, 7, 8 and related descriptions thereof.</p> <p>August 7, 2006 Amendment and Response to Office Action Dated May 3, 2006, at 13</p> <p>January 30, 2007 Declaration under 37 CFR 1.132, at 4 ¶ 6f1</p> <p><i>See also</i> '283 at 9:29–34.</p>	<p>meaning.</p> <p>If a construction is required, in the alternative: a representation of the variation of radiation across a defined area</p>	<p>FIGS. 2A-2C, 4A-4C, 7, and 8 of the '175 Pat. (BEST00001835-36, 1838). "A delivery cost term is assigned to an intensity map based upon the complexity of the intensity map. Maps with more intensity changes generally require more segments to deliver, and thus are assigned a larger delivery cost term." '175 Pat., at col. 2, lns. 51-55. (See BEST00001839). The '175 Pat. incorporates the contents of the '283 Pat. and the '096 Pat. '175 Pat., at col. 4, lns. 27-32. (See BEST00001840). "The optimizer of the present invention computes an optimized treatment plan, or beam arrangement, which should be understood to include either the optimal beam</p>

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					<p>positions around the treatment field, the optimal array of beam weights, or beam intensities, otherwise known as an intensity map or a fluence profile or both.” ’283 Pat., at col. 9, lns. 29-34. (See BEST00000014).</p> <p><b>’175 Pat. File History</b></p> <p>Pirzkall et al. was cited by the PTO. See Office Action dated 05-03-2006, at p. 5. (See BEST00001930).</p> <p>“IMRT plans consist of a large number of small beams, each of which may, and usually tend to, have an intensity of less than 100%.... the more complex the plan, the more variable will be the average beam intensity and the greater will be</p>

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					<p>the number of subfields required to deliver the intensity map with a MLC.” Pirzkall et al., at p. 1378. (See BEST00001942). “The radiation therapist’s challenge is to determine the best number of fields and delivered intensity levels to optimize the dose volume histograms, which define a cumulative level of radiation which is to be delivered to a specified volume. The outputs of the optimization engines are intensity maps, which are determined by varying the intensity at each ‘cell’ in the map. The intensity maps specify a number of fields defining desired (optimized) intensity levels at each cell... Once radiation has been</p>

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					<p>delivered according to the intensity map, the accumulated dosage at each cell, or dose volume histogram, should correspond to the prescription as closely as possible.” EP 0911065 (cited by Applicant in an IDS dated 07-28-2006), at para. [0065]. (See BEST00001975).</p> <p>“Traditional inverse intensity modulated radiation therapy (“IMRT”) planning systems attempt to find radiation intensity maps resulting in the best calculated dose distribution for a specific tumor for a specific patient. That is, in the conventional optimization process, the optimizer selects a beam arrangement which provides optimal</p>

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					<p>dosimetric fitness. For many treatment plans, the resultant intensity maps often cannot be efficiently delivered by the radiation therapy treatment equipment... Inefficient intensity maps may require a large number of monitor units (“MU”) or a large number of “MLC” segments for delivery.”</p> <p>Response to Office Action dated 08-03-2006, at p. 13. (See BEST00002095).</p> <p>“Regarding Claim 21, for example, neither of the cited documents disclose, teach, or suggest a delivery cost term, such as that featured in Claim 19, is a function of a number of intensity changes across the respective intensity map.... Applicant</p>



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					respectfully submits that there may be confusion between the number of intensity changes across the intensity map and the segment count. Counting the number of intensity changes across the intensity map is a quick operation with computational complexity...On each inner loop iteration, for example, the optimizer can traverse the intensity map and count the number of edges adjoining adjacent pencil-beams such that the two adjacent pencil-beams have different fluences. This counting intensity levels beneficially has computational complexity linear with respect to the size of the intensity maps.”

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					Response To Office Action dated 01-25-2007, at pp. 18-19. (See BEST00002174-2175).
<b>10</b>	<p>“determine [a/the] collimator angle of [a/the] multi-leaf collimator”</p> <p>(’490 patent claims 4, 17-18)</p>	select [a/the] rotation angle of [a/the] multi-leaf collimator at a particular gantry angle	’490 at 1:36–37; 2:20–32; 2:46–51; 3:53–57; 4:19–22; 4:25–30; 8:18–43 (and related Figures); 9:2–15; 10:2–6.	<p>Plain and ordinary meaning.</p> <p>If a construction is required, in the alternative: select a rotational position of the multi-leaf collimator</p>	<p><b>’490 Pat. Specification</b></p> <p>“The algorithm utilized in embodiments of the present invention is based upon two hypotheses: (1) that the maximum number of segments in a radiation beam is dominated, or determined, by the MLC leaf pair of a plurality of leaf pairs 41 (FIG. 17) which delivers the maximum number of beamlets, or radiation beamlets; and (2) that the number of segments in a pair of MLC leaves is proportional to an effective leaf travel distance (the number of pencil beamlets).” ’490</p>

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					<p>Pat., at col. 6, lns. 13-20. "In the algorithm used in embodiments of the present invention, the collimator angles are chosen so that the maximum amount of movement in individual MLC leaf pairs, at a certain collimator angle, is a minimum, as the maximum number of segments in a beam is largely determined by the MLC leaf pair which performs the maximum number of segments. The cost function to favor, or enhance, delivery efficiency, the reduction of segments, in determination of the collimator angle is:</p> $f(\theta_o) = \min\{\max l_e(\theta)\}$ <p>where <math>(\theta)</math> is the collimator angle varying from 0 to 180, 1</p>

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					<p>degree/step, and <math>(\theta_o)</math>, is the optimized angle.</p> <p>The procedure is to search the maximum effective length of MLC pairs in a certain collimator angle, and then find the minimum values from, in this example, the 180 maximum effective lengths. Combining the new algorithm utilized in embodiments of the present invention with the algorithm based upon Brahme's theory, the cost function to determine the collimator angle is:</p> $f(\theta_o) = \min\{A \max[l_e(\theta)] + B\sigma(\theta)\}$ <p>where <math>\sigma(\theta)</math> is the area difference between what an MLC can define and the target area, and A and B are weight factors used in the algorithm to select a focus between delivery efficiency and</p>

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					conformity.” ’490 Pat., col. 6, lns. 35-61 (BEST00001601).

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